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# NAVAL POSTGRADUATE SCHOOL

## Monterey, California



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# THESIS

AN ANALYSIS OF THE EFFECT OF ASVAB WAIVERS  
ON A-SCHOOL ACADEMIC ATTRITION

by

Roland James Yardley

December, 1990

Thesis Advisor:

Alice Crawford

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**An Analysis of the Effect of ASVAB Waivers  
on A-School Academic Attrition**

by

**Roland James Yardley  
Lieutenant, United States Navy  
B.B.A., University of New Mexico, 1983**

**Submitted in partial fulfillment  
of the requirements for the degree of**

**MASTER OF SCIENCE IN MANAGEMENT**

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## **ABSTRACT**

The purpose of this thesis was to analyze the effect of ASVAB waivers on A-School academic attrition. This was accomplished by developing a Statistical Analysis System (SAS) computer program, utilizing extracts of the Enlisted Training Tracking File (TRAINTRACK) and the Navy Enlisted Classification Tracking File (NECTRACK). In addition, a review of literature was undertaken to provide a summary of available information on factors that influence attrition, aptitude testing and ASVAB validity, trends in academic attrition, and criteria for the selection of waived students to attend Navy A-School. The data base was explored by conducting an analysis of those individuals who did not have the prerequisite ASVAB score, and then comparing their A-School academic performance with those who had attained the prerequisite score. Several recommendations are offered concerning the policy of allowing ASVAB waived individuals to attend specific high attrition A-School pipelines. In addition, further study is recommended, using the programs developed for this analysis, to analyze the A-School academic performance of ASVAB qualified and waived students.

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## I. INTRODUCTION

The Department of Defense requires that all of the Armed Services use a single test battery both for screening enlistees and for assigning them to military occupations. The Armed Services Vocational Aptitude Battery (ASVAB), which consists of ten subtests, is used for this purpose. Individuals who meet the Navy's standards for enlistment must also achieve a minimum score on one of several "aptitude composites" (or combination of ASVAB subtests) to qualify for assignment to A-school.

In certain cases, the requirement for the minimum score on the prerequisite aptitude composite is waived. This allows personnel who have a below-minimum score, but are considered qualified in other respects, to attend the A-school. The factors considered in granting an ASVAB waiver are the number of points to be waived, the needs of the Navy for A-school graduates, and the supply of qualified personnel available. The A-school academic performance of individuals who require an ASVAB waiver provides the main focus for this thesis.

Training performance at Navy A-schools is selected for this study due to the higher percentage of attrition found in A-schools compared to C-schools or Fleet schools. The Navy conducts ongoing research and implements programs to decrease A-school attrition. These studies indicate that attrition rates at A-schools can be attributed to academic, motivational, disciplinary, and administrative causes, but the effects attributable to allowing personnel with ASVAB waivers to attend are not known.

A-School attrition has the most impact on enlisted ratings that require an individual to attend several pipeline training courses to achieve a final rating classification. The initial skill rating pipeline is divided into a sequence of prerequisite courses. An individual designated for a particular rating must attend and graduate from all prerequisite courses to become a qualified A-School graduate. The sum of the attrition at each training course yields the pipeline attrition rate. This thesis examines the Navy's 15 highest attrition A-School pipelines for fiscal 1988.

#### A. PURPOSE

A-School attrition is wasteful and costly to the Navy. [Ref 1: p. 15]. In the context of defense budget reductions and proposed decreases in end-strength, efficiencies must be found in the process of selecting recruits to attend Navy A-Schools. The ASVAB is used as an indicator of training success. Persons who attend Navy A-Schools without meeting the prerequisite ASVAB score, may not successfully complete A-School at the same rate as those who are ASVAB qualified. The goal of this research is to identify assignment decisions which would decrease attrition and save valuable training dollars. Therefore, the policy to waive an ASVAB minimum score requirement needs to be reconsidered. The objective of this study is to explore the relationship between academic disenrollments and waived entrance requirements.

## B. RESEARCH QUESTIONS

Although ASVAB scores are proven to be accurate predictors of training school success, persons without the required entrance score are still in attendance at Navy A-Schools. The primary research question discussed in this thesis is: do persons who are granted ASVAB waivers have a higher incidence of academic attrition than those not requiring a waiver? Subsidiary research questions include the following:

1. In which ratings is the occurrence of academic attrition for persons with an ASVAB waiver higher than for those not requiring a waiver?

2. Are academic setback rates higher for persons with ASVAB waivers than for non-waivered persons?

3. Do persons who require an ASVAB waiver, who are academically setback in A-School, experience higher attrition rates than persons academically setback who are fully ASVAB qualified?

4. Do persons requiring ASVAB waivers have a higher frequency of nonacademic attrition than those persons not requiring a waiver?

## C. SCOPE AND LIMITATIONS

The focus of this thesis will be to examine the A-school performance of persons who have been granted an ASVAB waiver and have been assigned to one of the Navy's 15 highest attrition A-School pipelines in fiscal 1988. The 15 highest attrition A-Schools were chosen for this study because these schools present an adequate number of total disenrolled students to be analyzed, they have been identified as having a problem with attrition, and the

impact of focusing on high attrition pipelines is that the results can be used to make policy decisions that will potentially reduce attrition from these pipelines and ultimately save the Navy valuable training dollars.

Limitations of the research are that the analysis of the effects of ASVAB waivers on A-School academic attrition is conducted only on data from fiscal year 1988. The review of A-School academic attrition for fiscal year 1988 reflects the most current data available for a period in which the waiver policy was constant.

#### **D. ORGANIZATION OF STUDY**

Chapters II and III provide the context for the research questions addressed in this thesis. First, the background serves to delineate the specific problems the Navy encounters as a result of student attrition from training. The enlisted classification process, where sailors are initially screened for a Navy rating, is examined. Paths for sailors to attend A-School who do not achieve the required minimum ASVAB scores are reviewed. The tradeoffs of making the best use of limited manpower are addressed.

The literature review examines studies related to the performance of ASVAB waived personnel in Navy A-Schools, assesses recent trends in academic attrition, evaluates the validity of the ASVAB, and examines the characteristics of individuals who will benefit or lose in the event of a change of waiver policy.

The methodology chapter delineates the specific structure of the programming techniques used to extract the required data, and

the method of attrition accounting is detailed.

Data collection and interpretation of results is presented in the following chapter. Each of the top 15 high attrition A-Schools is graphically illustrated to underscore the effect of waivers on academic and non-academic attrition, and academic setbacks. Analysis and interpretation of the data collected are also presented in this chapter.

The last chapter presents the conclusions of the effect of ASVAB waivers on A-School academic attrition based on the data collected. Answers to the research questions are outlined and recommendations are presented.

## II. BACKGROUND

The purpose of this section is to review research on Navy enlisted training as it relates to the topic of the effect of ASVAB waivers on A-School academic attrition. The topics addressed here include: an overview of Navy enlisted training; a background on aptitude testing; ASVAB validity; factors influencing A-School attrition; trends in academic attrition; Navy concerns about attrition; winners and losers (regarding a change in the ASVAB waiver policy); framework for analysis, and a summary. These topics are highly interrelated. In many instances the results in one area are directly affected by events in another area. For example, fleet requirements for A-School graduates from training pipelines require that a high number of persons to be trained each year. In a bad recruiting year, the ASVAB waiver policy is the valve that opens to fill required seats at Navy A-schools. In this respect, an increase in the number of persons granted waivers may be the reason behind the trend in increasing academic attrition. An understanding of the performance of persons granted ASVAB waivers at Navy A-Schools should help policy makers understand, anticipate, and plan for the resulting implications of allowing individuals with ASVAB waivers attend Navy A-Schools.

At a time when the supply of potential recruits is shrinking and budgets are being reduced, the Navy must investigate all possible markets for future sources of manpower. In the absence of persons who can achieve the prerequisite ASVAB scores to qualify for Navy A-Schools, less qualified A-School attendees may be

recruited to fill the required A-School seats. This literature review provides some background that explores how recruit ASVAB scores affect academic attrition rates. An understanding of factors that affect attrition is essential to establishing policy decisions that can influence attrition rates.

#### A. NAVY ENLISTED TRAINING

Navy enlisted training consists of recruit training and specialized skill training. Recruit training is accomplished at "boot camp," the Navy's Recruit Training Commands. Specialized skill training consists of initial skill training and progression skill training. [Ref. 2: p. II-4]. Initial skill training is performed at Navy A-Schools. Three-quarters of all graduates from RTCs proceed directly from boot camp to class "A" schools to receive specialized skill training. [Ref. 3: p. 1]. While specialized skill training can also be achieved through on-the-job training in the fleet, "A-school training is the most cost-effective method of training recruits for most of their initial assignment in the fleet." [Ref 4: p. 14].

The Navy invests heavily in specialized skill training. The projected totals for the number of sailors who will attend Navy A-schools for fiscal 1991 are 128,049, and 126,603 for fiscal 1992. The projected graduation totals are 117,411 and 116,161 for fiscal 1991 and 1992, respectively. [Ref 2: p. V-5] The difference in these totals represents projected losses as a result of student attrition from training. Historically, approximately half of A-School attrition is the result of students being dropped for



academic reasons. [Ref. 3: p. 21] With a training investment of this size, even small improvements in the efficiency of the system can lead to substantial savings.

## **B. APTITUDE TESTING**

The Department of Defense requires that all of the Armed Services use a single test battery for screening enlistees and assigning them to military occupations. The ASVAB, which consists of ten subtests, is used for this purpose.<sup>1</sup> "The content of the ASVAB has been carefully chosen to measure individual skills and knowledge considered necessary in military jobs." [Ref. 5: p. 115]. The ten ASVAB subtests along with a brief description of the abilities measured are listed in Table 1. The specific standard scores in use by the Navy for occupation training assignments are delineated in the Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards.

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<sup>1</sup>The ten subtests are General Science (GS), Arithmetic Reasoning (AR), Word Knowledge (WK), Paragraph Comprehension (PC), Numerical Operations (NO), Coding Speed (CO), Auto and Shop Information (AS), Math Knowledge (MK), Mechanical Comprehension (MC), and Electronics Information (EI).

**TABLE 1****DESCRIPTION OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB)**

<b>ASVAB Subtest</b>	<b>Description</b>
General Science (GS)	Measures knowledge of physical and biological
Arithmetic Reasoning (AR)	Measures ability to solve arithmetic word problems
Word Knowledge (WK)	Measures ability to select the correct meaning of words presented in context and to identify the best synonym for a given word
Paragraph Comprehension (PC)	Measures ability to obtain information from written passages
Numerical Operations (NO)	Measures ability to perform arithmetic computations in a speeded context
Coding Speed (CS)	Measures ability to use a key in assigning code numbers to words in a speeded context
Auto and Shop Information (AS)	Measures knowledge of automobiles, tools, and shop terminology and practices
Mathematics Knowledge (MK)	Measures knowledge of high school mathematics principles
Mechanical Comprehension (MC)	Measures knowledge of mechanical and physical principles and ability to visualize how illustrated objects work
Electronics (EI) Information	Measures knowledge of electricity and electronics
-----	

Source: Department of Defense, Counselor's Manual for the Armed Services Vocational Aptitude Battery - Form 14 (Chicago, IL.: Military Entrance Processing Command, July 1984).

To qualify for enlistment, potential recruits must achieve a minimum score on the Armed Forces Qualification Test (AFQT). "The AFQT score is an aptitude composite that combines the Word Knowledge, Paragraph Comprehension, Arithmetic Reasoning, and

Numerical Operations subtests from the ASVAB." [Ref. 5: p. 69].

During enlistment processing, recruits are interviewed by an enlisted classifier who balances the recruit's training desires with the needs of the Navy. Individuals who meet the Navy's minimum AFQT standard for enlistment must also achieve a minimum score on one of several "aptitude composites" (or combination of ASVAB subtests) to qualify for assignment to A-school. In certain cases, the requirement for a minimum score on an aptitude composite is waived.

There are three ways for a person to gain assignment to A-School without attaining the prerequisite ASVAB composite score. First, in the assignment process, in the event the number of qualified new accessions and recruits falls below the number necessary to meet authorized school quotas, "some recruits are granted an ASVAB waiver for assignment to class "A" school."

[Ref. 6: p. 7-2]. Second, sailors who did not attend an A-School and who have been assigned to their first duty station for 12 months, may request assignment to A-school. [Ref. 6:p. 7-2]. ASVAB waivers for fleet sailors are considered by Commander, Naval Military Personnel Command (NMPC-482), on a case by case basis. Third, the Job Oriented Basic Skills (JOBS) Program qualifies ineligible personnel for A-School, and also trains personnel who are ASVAB qualified for more academically demanding A-schools. The JOBS entrance criteria are based on the ASVAB requirement of the school with a 30-point window. [Ref 7: pp. 1-2] JOBS quotas are filled with an 80/20 mix of accession and fleet inputs,

respectively. This program enhances upward mobility and is intended for motivated, but educationally deficient personnel.

JOBS was conceived in 1977 in response to widely predicted shortfalls in high quality accessions (individuals with a high school diploma scoring in mental categories I, II, or upper III on the ASVAB). [Ref. 7: p. 1]. Persons in the JOBS training program do not retake the ASVAB upon completion of the training.

Therefore, the effect of the JOBS training on increasing an individual's ASVAB scores is not known. JOBS Program entrants, as well as all other persons who did not meet the prerequisite ASVAB score established as the minimum to gain admission to the Navy A-Schools, are included in this analysis.

The factors considered in granting an ASVAB waiver are: the number of points to be waived, the needs of the Navy for A-school graduates, and the supply of qualified personnel available.<sup>2</sup> Granting waivers allows persons who have a below-minimum score, but are considered qualified in other respects, to attend the A-school. The established test score waiver criteria are outlined in appendix A. These waiver criteria establish limits for the number of points to be waived for an individual, depending on the number of ASVAB subtest combinations that must be added together to meet the specific ASVAB prerequisite score for A-School admittance.

The objectives of the decision-maker who decides whether or

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<sup>2</sup> These criteria for granting ASVAB waivers were obtained through a conversation with CWO4 O'Leary, A-Schools Management Office, Naval Military Personnel Command (NMPC-482), on August 16, 1990.

not to allow a person to attend a Navy A-school without the prerequisite ASVAB scores are: to obtain the highest quality A-school graduates in the fleet, meet the need for the required number of A-school graduates at operational units of the fleet, balance these needs against the qualified military available (QMA), determine if the criteria coincide and take costs into consideration. The decision-maker must make the best use of limited manpower. A 1989 study on evaluating aptitude standards to determine qualification into military specialties stated that:

the tradeoffs and comparisons among the outcomes of various minimum aptitude standards exemplify the thought process conducted by policy makers. Extensive value judgements are involved. Significant improvement in selection decisions is the primary reason for using aptitude tests in the accession process. [Ref 8: p.17].

Since the ASVAB test is not perfectly related to performance, some incorrect selection decisions are inevitable. These incorrect decisions affect both the services, who will access a limited number of unsuccessful performers, and applicants, who would have been successful performers if selected. The goal of setting aptitude standards, such as minimum ASVAB scores, is to find an equitable balance that allows the Navy to accomplish its mission.

### C. ASVAB VALIDITY

There has been considerable research conducted by civilian experts to determine the validity of the ASVAB as a predictor of military training and job performance, including its applicability to minority groups and the different sexes. It was found that:

the battery has been shown to be equitable in predicting success in technical training for diverse military occupations among males and females, and majority and minority group members alike. [Ref 9: p. 112]

An ASVAB validation study performed by the Navy Personnel Research and Development Center (NPRDC) to determine the predictive performance of the ASVAB in Navy technical schools stated that,

While the criterion of ultimate concern may be performance on the job, ... the ASVAB is validated against measures of training performance such as final course grade, time in training, or a pass/fail (attrition) criterion. The reasons for this approach are that adequate measures of Navy job performance are simply not available, training performance provides evidence of a person's ability and desire to learn and perform necessary job skills, and this ability and desire could be expected to predict later job success. In addition, validation of ASVAB selectors against final grades helps to ensure that only persons with a high probability of mastering course material are selected; which helps to reduce training costs. [Ref. 10: p. 1]

Despite empirical evidence that ASVAB scores are accurate predictors of training and job success, waivers of the prerequisite ASVAB score are granted by the Enlisted A-Schools Management Office at Naval Military Personnel Command (NMPC-482). Although occupational standards or prerequisite ASVAB scores do not change dramatically with the times, the policy on waivers is the gate that opens and closes in response to shortages in occupational specialties in the fleet.

#### **D. FACTORS INFLUENCING A-SCHOOL ATTRITION**

Training performance at Navy A-schools was selected for this study due to the higher percentage of attrition found in A-schools

compared to C-schools or Fleet schools. The Navy has conducted considerable research and implemented programs to decrease A-school attrition. Attrition rates at A-schools can be attributed to academic, motivational, disciplinary, and administrative causes but the effects attributable to allowing personnel with ASVAB waivers to attend have not been thoroughly analyzed.

One objective of a 1985 study conducted by the Navy Personnel Research and Development Center (NPRDC) was to examine attrition rates of students at Navy technical A-schools who had not met the cutoff scores on the ASVAB selector composites. It was revealed that most of the 47 A-schools included in the study had students who did not meet the prerequisite ASVAB scores. Certain schools had larger percentages of waived students than others. This was due to:

(1) changes in the ASVAB selection criteria for these schools, (2) involvement of the schools in the JOBS programs, and (3) waivers granted to permit enlistees scoring below the ASVAB school selection criteria to attend the schools. [Ref 11: p. 32]

The findings revealed six schools for which the percentage of waived students was 13 percent or greater. NPRDC stated that "the attrition rates for all but one of the six schools exceeded the overall mean attrition for the 47 A-Schools, which was 4 percent." [Ref. 11: p. 20] They concluded that attrition in two ratings could have been reduced by permitting fewer enlistees to attend A-School who required an ASVAB waiver. In the other schools, "other factors responsible for the attrition should be sought." [Ref 11: p. 20]. Other factors that should be considered

would include differentiating the academic attrition rates between high school graduates and non-graduates.

The author of a study that analyzed aptitude criteria with regard to the testing, selection, and classification of military recruits explains that:

The personal attributes that enable certain teenagers to follow through and finish high school - whether maturity, motivation, ambition, strength of character, determination or persistence, or, as some contend, the ability to tolerate boredom and routine - apparently help to make them more successful and productive members of the nation's military. [Ref 5: p. 25].

Other researchers also emphasized the importance of having a high school diploma in their study on A-School attrition. They stated that "the key factor influencing survival is high school diploma status." [Ref 3: p. 6] For this reason, high school graduation status should be considered in the granting of waivers for A-School training for an occupational specialty.

## **E. TRENDS IN ACADEMIC ATTRITION**

A 1988 study by the Center for Naval Analyses (CNA) examined the reasons for attrition from Navy A-schools. Of particular concern was that:

the proportion of attrition due to academic failure increased significantly between 1981 and 1983 and again in 1985. The analysis indicated that about half of A-school attrition is for academic reasons and that this proportion has been increasing in recent years. [Ref. 3: p. 21].

With the Navy's huge investment in specialized skill training, small improvements in the reduction of academic attrition can lead



to substantial savings and greater efficiency.

Table 2 illustrates the recent increase in percentage of total attrition as well as the overall increase in academic attrition from fiscal 1982 through 1989.

**TABLE 2**  
**A-SCHOOL ATTRITION RATES FOR FISCAL 1982 THROUGH FISCAL 1989 (IN PERCENTAGES) BY ACADEMIC AND NONACADEMIC CAUSES**

	Fiscal Year							
	1982	1983	1984	1985	1986	1987	1988	1989
Academic	3.5	3.5	3.5	4.7	4.9	5.3	5.3	5.2
Nonacademic	4.0	3.3	3.6	3.8	4.6	4.9	4.8	5.9
Total	7.5	6.8	7.1	8.5	9.5	10.2	10.1	11.1

Source: CNA's NITRAS Training Summary File (TSF)

This thesis focuses on fiscal 1988. It is clear from Table 2 that, since 1984, total A-School attrition has been on the rise. In technical ratings, failure rates are about 30 percent. [Ref 3: p. 1] About 15 percent of all enlistees are assigned to technical ratings. [Ref. 5: p. 163].

When a sailor disenrolls from an A-School, the school recommends that the student either be reassigned to the fleet for duty, be reclassified and assigned to another A-School, or be discharged from the Navy. Shiells, in her study regarding the relationship between A-School and Navy attrition, states that,

Of all attrites that were recommended for a

fleet assignment, 6 percent were no longer in the navy three months after leaving A-School. An additional 16 percent left between 3 and 12 months, so that after having attrited (from A-School), 22 percent of the fleet assignees had left the Navy. Out of all (A-School) attrites, 26 percent were out of the Navy 30 months after leaving A-school." [Ref. 12: p. 5].

Knowing what happens to persons after they fail to complete A-School is instructive when making decisions about screening A-School candidates.

#### **F. NAVY CONCERNS ABOUT A-SCHOOL ATTRITION**

The Navy has many legitimate reasons to be concerned about attrition in A-school, because attrition adversely affects the Navy in several ways. Navy manpower managers of enlisted ratings need a reliable source of newly-trained sailors to replace the fleet sailors, who are performing operational functions in the fleet and are due for rotation or discharge. A-school attrition requires recruiting commands to achieve higher recruit totals in order to maintain acceptable rate end-strength levels. Student attrition in training, and corresponding increases in recruiting to offset attrition losses, represent lost resources for the Navy. These lost resources include: student pay and travel costs, instructor pay, and lost productivity of the students and instructors while the students are in a training status.

The results of this research effort will be helpful in evaluating the current policy of accepting ASVAB waivers at Navy A-schools. The study should also provide useful information to training commands, recruiting commands, and Navy manpower planners,

and may suggest that changes are required in assigning personnel to A-school training.

#### G. WINNERS AND LOSERS

There are tradeoffs associated with changes to an ASVAB waiver policy. If the Navy shifts to strict adherence of entrance requirements, which results in higher quality recruits, then the winner in achieving higher quality recruits at Navy A-Schools is the Navy. The Navy will effectively obtain higher quality, higher ability recruits by allowing only fully-qualified young persons to enlist. National defense, as well as the Navy, will benefit from this action.

The losers may be the minorities and underprivileged persons who are the most likely recipients of an ASVAB waiver. Unfortunately:

disadvantaged youths and minorities probably have more to lose than most from a system that focuses on training performance rather than job performance. The aptitude tests presently used for initial screening and assignment obviously call for certain levels of achievement and skills in reading and test taking. ... The unfortunate truth for disadvantaged youths and minorities is that educational opportunities in this country are not equally distributed across socioeconomic, geographic, or cultural boundaries; and any system that stresses skills stemming directly from education is bound to favor one population group over another. [Ref 5: p. 81].

It is not the author's intent to favor one population group over another. If the Navy is faced with a 25-percent reduction in force over the next five years, the military will not be representative

of the civilian population by quality measures. The Navy will move to become a very high quality force, because reducing accessions will result in greater competition for the jobs available. The Navy will capitalize on this by choosing only the most qualified applicants.

Strict adherence to entrance requirements will also have an adverse effect on persons without high school diplomas. The 1980 Profile of American Youth sums up the effect of being a high school non-graduate on ASVAB scores:

aptitude test scores tend to increase, on the average, in direct correspondence with advances in an individual's level of education. The combination of higher minimum aptitude standards and lower average scores for high school dropouts reduced considerably the number and percentage of non-graduates who would have been eligible for military service. [Ref 9: p. 70].

Individuals who do not have a high school diploma will be losers in the face of reducing accessions and increasing the quality of entrants at the Navy A-Schools.

An opposing argument that can be presented for a liberal waiver policy is to look at the positive aspects of allowing ASVAB waived persons to attend Navy A-Schools. These individuals would be relatively easy to recruit, which may help reduce recruiting costs. The clear winners in this case are the individuals, who otherwise would not have been qualified to attend A-School, and who are given the opportunity to learn an occupational skill. In many

cases, two out of three waived students pass A-School.<sup>3</sup> The question may be posed, why not allow these individuals the opportunity? It costs money, but,

..the impact of the Armed Services as a place of relative opportunity, equal acceptance, and involvement, regardless of prior social disadvantage, has helped to make the military a traditional channel for social mobility.  
[Ref 9: p. 100].

Reducing the avenue for disadvantaged youths to attend Navy A-Schools and learn a rating may have a negative, long-term effect on this segment of the population. However, cutting off this opportunity does not totally reduce students' opportunity to learn and achieve a rating who were not ASVAB qualified to attend the A-School. They may qualify for the JOBS program or "strike" for a rating in the fleet through on-the-job-training.

The question is, how much quality is needed to accomplish the goal of maintaining a strong Navy, given budgetary constraints? A higher quality force expects higher pay and benefits. Additionally, if the Navy adopts the policy of recruiting only fully-qualified persons (i.e., no ASVAB waivers), will the Navy have an equitable representation of minorities? The Navy has to delicately balance its organizational needs for a high quality work force against mandated equal opportunity goals. There is social benefit derived from the Navy being an avenue for social mobility. This social benefit must also be balanced against the need for

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<sup>3</sup>Based on conversation with CWO4 O'Leary, Head of A-Schools Management, Naval Military Personnel Command (NMPC-482) on 16 August 1990.

military effectiveness.

#### **H. FRAMEWORK FOR ANALYSIS**

This analysis focuses on the A-schools that experienced the highest attrition rates for fiscal 1988. The 15 highest attrition A-Schools are included. Those individuals who did not meet the minimum ASVAB requirement for the specific A-School delineated are identified. The performance of these individuals is evaluated by determining if their academic attrition and setback rates are different from those individuals who did not require a waiver. This analysis will also reveal the ratings, among the top 15 attrition schools, where the effect of an ASVAB waiver is more pronounced in relation to academic attrition and academic setbacks. Given that an individual has been academically set back, persons who required ASVAB waivers are evaluated to determine if they eventually become disenrolled at a higher rate than those who are ASVAB qualified.

The statistical analysis of the performance of persons who required an ASVAB waiver will give a better understanding of how these individuals performed in A-school. This analysis is not the final answer. As discussed above, there are many qualitative arguments that exist that are not adequately covered by statistical analysis of performance.

#### **I. SUMMARY**

Although the ASVAB has been shown to be a valid predictor of an individual's success in training, A-School managers do allow

persons who have not achieved the required minimum ASVAB score to attend A-Schools. These managers react to fleet A-School graduate requirements based on the available pool of manpower to choose from and the urgency of the need. This analysis documents the performance of ASVAB-waivered persons at Navy A-Schools, and explores the implications of the policy to waive ASVAB A-School prerequisites. In the context of defense budget reductions, proposed decreases in end-strength, and high costs incurred by academic attrition at A-Schools, the information from this study will support decision-makers in their efforts to respond to the needs of the fleet.

### III. METHODOLOGY

The information required to document the performance of personnel with ASVAB waivers is the person's training performance at A-School and the individual's score on the ASVAB. Once an individual's training performance is obtained, it can be matched with the prerequisite ASVAB score required to attend the A-School, to determine if the individual was a waived or qualified student. The source of training performance is found in the Enlisted Training and Tracking File (TRAINTRACK). TRAINTRACK documents each individual's enlisted training history. The TRAINTRACK data base contains the longitudinal record of training for each individual who attended a school that reports to Navy Integrated Resources and Administration System (NITRAS). [Ref 13: p. 1]. Navy A-Schools submit training reports to NITRAS. TRAINTRACK is updated at the end of each fiscal year to post changes to an individual's record.

The Navy Enlisted Classification Tracking File (NECTRACK) contains selected individual biographical information derived from the Enlisted Master File at the Navy Military Personnel Command (NMPC). The individual's ASVAB score is the variable of interest in the NECTRACK. Once the individual's ASVAB score is ascertained, the score can be compared against the Navy A-Schools attended to determine if the individual required an ASVAB waiver to attend the school. The TRAINTRACK and NECTRACK data were obtained from the Navy Personnel Research and Development Center. The essential data derived from the TRAINTRACK and NECTRACK were as follows:



#### **TRAINTRACK DATA SET:**

<u>Variable</u>	<u>Description</u>
ENR1	Enrollment date. Julian date on which the individual enrolled in class.
ALD1	Actual loss date. Julian date on which a student completed or was disenrolled from a class.
SAC1	Student action code. A 3-character code indicating the final SAC action that occurred for the student prior to transfer or discharge.
ASB1	Academic setbacks. A 2-position number indicating the total number of academic setbacks incurred in this particular course.
CDP1	Course data processing code. A code that identifies each course at a particular training activity.

#### **NECTRACK DATA SET:**

<u>Variable</u>	<u>Description</u>
TESTID	Test identification. A 2-position code that identifies one of the particular test series administered to the recruit.
ASVAB	Armed Services Vocational Aptitude Test Battery.
EDUC	Years of education.
CERT	Educational certification.

Through the use of these variables, it is possible to gain information on differences in academic performance associated with achieving or not achieving the prerequisite ASVAB score required for entrance at a Navy A-School.

A common variable to both the TRAINTRACK and NECTRACK data bases are the individual's social security numbers. By first selecting the individuals who attended the 15 high attrition training pipelines in the TRAINTRACK for fiscal 1988, the

TRAINTRACK was then merged with the NECTRACK. The data sets were combined to allow the individual's A-School training performance and corresponding ASVAB scores to be evaluated.

The indicator of A-school training performance from the TRAINTRACK was contained in the SAC, a code indicating the final action that occurred for the student prior to transfer or discharge. ASVAB scores from the NECTRACK provide the essential performance data to determine if the individual was a waived or non-waived student. The TRAINTRACK data element, CDP, was used to select the 15 highest attrition Navy A-Schools for fiscal 1988. Table 34 identifies the 15 schools selected and the associated CDPs for the specific training pipeline.

**TABLE 3. TOP 15 ATTRITION RATING PIPELINES AND CORRESPONDING COURSE DATA PROCESSING CODE (CDP) FOR FISCAL 1988**

<u>RATING</u>	<u>COURSE DATA PROCESSING CODES</u>			
Air Traffic Controller (AC)				6278
Aviation Electrician's Mate (AE)		6218		6515
Aviation Anti-Submarine Warfare Operator (AW)	6594	6224		6537
Boiler Technician (4YO) (BT4)		6260		6486
Boiler Technician (6YO)	614F	614H		6488
Cryptologic Maintenance Technician (CTM)		605A		6161
Electronics Technician - Advanced				
Electronics Field (ET-AEF)	6414	6409	6403	603V
Firecontrolman (FC)		614A	614B	609W
Gunners Mate (GM)		6400	6370	607W
Gas Turbine Systems Technician				
Electrical (6YO) (GSE)	606C	614N		614R
Gas Turbine Systems Technician Mechanical (GSM)		614W		614T
Machinist's Mate (4YO) (MM4)		6262		6492
Machinist's Mate (6YO) (MM6)	614G	614J		608M
Opticalman (OM)				6047
Operations Specialist (OS)				6540

SOURCE: Chief of Naval Education and Training Notice 1514 dated November 1, 1987.

As indicated in Table 3, the range of pipeline courses that an individual can attend for the top attrition schools in fiscal year 1988 ranges from one to four courses.

Recruits who are scheduled to become rated proceed directly from the two-month recruit training course to an A-School. In most cases, completion of a specified course or a sequence of courses is required for recruits to be rated.<sup>4</sup> The Chief of Naval Education and Training published an instruction for fiscal year 1988 which lists the Navy Enlisted skill rating pipelines for each rating. [Ref. 14]. This instruction was used to define the A-School pipelines for the ratings in Table 3.

For each rating pipeline, a program was developed to determine the relationship between ASVAB waivers and A-School academic attrition for that specific pipeline. This program uses release 5.18 of the Statistical Analysis System (SAS) software on the Naval Postgraduate School's IBM 3033 mainframe computer. [Refs. 15 & 16]. The SAS program for each rating was developed using the following criteria: Only students with an enrollment date during fiscal year 1988 were considered in this study. The reason for this is that ASVAB prerequisite scores are periodically evaluated and subject to change. For fiscal 1988, ASVAB prerequisite scores from the Enlisted Transfer Manual (TRANSMAN), NAVPERS 15909c, change number 26 dated July 1, 1987, were effective for the entire fiscal year. To encompass only fiscal 1988 losses, only those

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<sup>4</sup> A sailor can also earn a rating through on-the-job without attending A-School.

students who were actual losses from their pipelines (either graduated or dropped) are considered in this study. Using the TESTID variable from the NECTRACK, which identifies the version of the ASVAB the individual was given, only those persons who had taken ASVAB tests 8-17 are considered in this analysis. These versions of the test are the only ones that have been given since 1985. The number of personnel who have an ASVAB version prior to 1985 and applied for A-School in 1988 are not considered significant for the purpose of this analysis.

There are, then, only three types of students who gain admittance to an A-School -- those students who required an ASVAB waiver to get in, those who were ASVAB qualified, and JOBS students. For each rating, the final student action code that can be assigned to a student falls into one of three categories: graduate, academic attrite, and nonacademic attrite. These groups were sorted to show frequencies and percentages of how persons requiring ASVAB waivers performed against those not requiring a waiver.

The academic setback rates were observed in each rating for persons with and without ASVAB waivers. The academic setback rates were further examined to reveal if ASVAB waived students who were setback had a higher attrition rate than ASVAB qualified students who were academically setback.

Finally, the non-academic attrition rates for each category of student was evaluated to determine if ASVAB qualified, waived or JOBS students were disenrolled at higher frequencies for non-

academic reasons. In addition, the overall attrition rate, which encompasses disenrollment for academic and non-academic reasons, is included to indicate the overall attrition rate by rating for ASVAB qualified, waived, and JOBS program persons.

## **IV. RESULTS**

### **A. SAMPLE POPULATION**

The data were first explored to establish the exact number and percentage of individuals within each of the 15 ratings who were fully ASVAB qualified, ASVAB waived, or JOBS program participants. In addition, there was missing ASVAB test information on some individuals, and their ASVAB test scores could not be determined. These individuals were identified, because without the ASVAB test performance data, there is no basis for evaluating the performance of these individuals.

A frequency analysis is displayed for each rating in Table 4, which categorizes the sample population into ASVAB qualified, ASVAB waived, JOBS program participants, or students with missing information. If an individual achieved a score equal to or greater than the prerequisite school entry score delineated in the Enlisted Transfer Manual, then the individual was considered ASVAB qualified. Conversely, if the person's score was below the minimum, the person was categorized into one of two groups. JOBS program students have not met the prerequisite ASVAB score, and since it is a special program geared to increase minority participation, JOBS students are categorized separately from other individuals who required an ASVAB waiver. Persons whose score could not be determined were placed into the missing information category.

**TABLE 4: NUMBER AND PERCENTAGE DISTRIBUTION BY RATING OF ASVAB QUALIFIED, ASVAB WAIVERED, JOBS STUDENTS AND PERSONS MISSING ASVAB INFORMATION BY RATING FOR THE TOP 15 ATTRITION A-SCHOOLS FOR FISCAL YEAR 1988**

<b>RATING</b>	<b>ASVAB QUALIFIED</b>	<b>ASVAB WAIVERED</b>	<b>JOBS PROGRAM</b>	<b>MISSING DATA</b>	<b>TOTAL</b>
AC	299 (82.60)	24 (6.63)	0 (0)	39 (10.77)	362 (100)
AE	839 (76.97)	87 (7.98)	0 (0)	164 (15.05)	1090 (100)
AW	625 (82.24)	29 (3.82)	0 (0)	104 (13.68)	758 (100)
BT4YO	807 (72.38)	110 (9.87)	67 (6.01)	131 (11.75)	1115 (100)
BT6YO	304 (73.61)	42 (10.17)	0 (0)	67 (16.22)	413 (100)
CTM	164 (83.25)	11 (5.58)	0 (0)	22 (11.17)	197 (100)
ET- AEF	1445 (80.01)	92 (5.09)	9 (.50)	260 (14.40)	1806 (100)
FC	1056 (73.03)	54 (3.73)	10 (0.69)	326 (22.54)	1446 (100)
GM	679 (72.16)	41 (4.36)	17 (1.81)	204 (21.68)	941 (100)
GSE6YO	319 (75.95)	13 (3.10)	0 (0)	87 (20.71)	419 (100)
GSM	264 (76.08)	21 (6.05)	23 (6.63)	39 (11.24)	347 (100)
MM4YO	1270 (70.36)	185 (10.25)	75 (4.16)	275 (15.24)	1805 (100)
MM6YO	304 (72.38)	43 (10.24)	0 (0)	73 (17.38)	420 (100)
OM	26 (76.47)	4 (11.76)	0 (0)	4 (11.76)	34 (100)
OS	1566 (71.02)	149 (6.76)	27 (1.22)	463 (21.00)	2205 (100)
<b>TOTALS</b>	9967 (74.61)	905 (6.77)	228 (1.71)	2258 (16.91)	13,358 (100)

Source: Enlisted Training Tracking File/Navy Enlisted  
Classification Tracking File (extract)

The sample population consists of 13,358 individuals who had enrolled into one of the top 15 attrition rating pipelines for fiscal 1988. Of the 13,358 persons, 9967 (74.61 percent) had met the prerequisite ASVAB score. The non-JOBS persons who scored below the minimum and required an ASVAB waiver totalled 905 (6.77 percent). The total number of JOBS students was 228 (1.71 percent). It should be noted that the JOBS students were enrolled in only seven of the 15 ratings examined in the sample population. The frequency of ASVAB qualified, ASVAB waived, and JOBS students would increase if accurate information were available for the 2274 (16.79 percent) students whose ASVAB scores had missing information. The frequency of missing test information varied by rating, and this missing test information is a limiting factor in this analysis.

The majority of the ratings examined had ASVAB qualified persons at a rate that closely parallels the ASVAB qualified average of 74.61 percent. The lowest percentage of qualified students were in the MM four-year obligor<sup>5</sup> rating at 70.36 percent. The CTM rating had the highest percentage of ASVAB qualified students with 83.25 percent.

The non-JOBS ASVAB waived students totalled approximately seven

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<sup>5</sup> Commonly used (as jargon) in reference to a person's enlistment contract. In this case, a four-year obligor enlisted with a four-year contract.



percent of the total sample population. The numbers and percentages of waived students varied greatly by rating. Excluding the OM rating, which had a small enrollment number (34), the highest number of waived students were in the MM four-year obligor with 185 persons (10.25 percent of enrolled students). The GSE six year obligor rating had the lowest percentage of waived students enrolled at 3.10 percent. The low number of ASVAB waived students in the following pipelines do not allow for a full comparison of their performance against those who were ASVAB qualified: OM (4), CTM (11), and GSE (13). Any comparison of students in these ratings of the ASVAB waived category against their qualified counterparts should take the overall numbers into consideration.

The JOBS program participants are represented in seven ratings, with the MM four-year obligor having the highest number of JOBS students enrolled (75), and the ET-AEF rating with the lowest number enrolled (9), in the sample population. The ET-AEF and FC rating's relatively small number of JOBS students enrolled, with 9 and 10 students, respectively, precludes a full comparison against those fully qualified in those ratings.

## **B. ACADEMIC ATTRITION**

The reasons for a student to be academically disenrolled are that the student was not able to achieve academic objectives or pass criterion tests, or the student could not achieve the shop or laboratory performance objectives. (Ref. 17: p. 19). This

analysis focuses on the academic performance of those individuals who were ASVAB qualified compared to ASVAB waived and JOBS students.

Table 5 illustrates the total number and percentage of academically disenrolled students who were fully ASVAB qualified, waived, or JOBS students, by rating. For example, in the AC rating, 60 individuals who were ASVAB qualified were academically disenrolled, which represents 20.07 percent of all ASVAB qualified students in the AC rating. Seven of the students who were ASVAB waived were academically disenrolled, and they represented 29.17 percent of all ASVAB waived students. Students with missing information from their ASVAB scores are not included in Table 5.

Table 5 illustrates the differences in attrition rates between ASVAB qualified, ASVAB waived, and JOBS students. This table serves to answer the overall research question of "do persons with ASVAB waivers academically disenroll at a higher rate than those persons who are fully ASVAB qualified". The results indicate that students who required waivers had higher rates of academic attrition in 13 of the 15 ratings examined. Only the MM6YO and GSM rating pipelines had a higher academic attrition rate for ASVAB qualified students than ASVAB waived students, but again, these numbers are small. JOBS students had higher academic attrition than the qualified and waived individuals in six of the seven ratings, with the exception being the OS rating, but these numbers are small, also.

TABLE 5

**COMPARISON OF A-SCHOOL ACADEMIC ATTRITION IN FISCAL  
YEAR 1988 FOR ASVAB QUALIFIED, ASVAB WAIVERED AND JOBS STUDENTS**

<b>RATING</b>	<b>NUMBER AND PERCENTAGE OF ACADEMIC DROPS FOR ASVAB QUALIFIED STUDENTS</b>	<b>NUMBER AND PERCENTAGE OF ACADEMIC DROPS FOR ASVAB WAIVERED STUDENTS</b>	<b>NUMBER AND PERCENTAGE OF ACADEMIC DROPS FOR JOBS STUDENTS</b>
AC	60 (20.07)	7 (29.17)	*
AE	89 (10.61)	45 (51.72)	*
AW	25 (3.90)	4 (13.79)	*
BT4YO	97 (12.02)	23 (20.91)	15 (22.39)
BT6YO	19 (6.25)	5 (11.90)	*
CTM	48 (29.27)	5 (45.45)	*
ET-AEF	351 (24.29)	32 (34.78)	4 (44.44)
FC	170 (16.10)	8 (14.81)	3 (30.00)
GM	167 (24.59)	17 (41.46)	9 (52.94)
GSE6YO	4 (1.25)	1 (7.69)	*
GSM	21 (7.95)	1 (4.76)	5 (21.74)
MM4YO	118 (9.29)	29 (15.68)	12 (16.00)
MM6YO	18 (5.92)	3 (6.98)	*
OM	6 (23.08)	3 (75.00)	*
OS	65 (4.15)	9 (6.04)	1 (3.70)
<b>TOTAL</b>	<b>1,259 (12.63)</b>	<b>192 (21.22)</b>	<b>49 (21.49)</b>

\* No JOBS students enrolled.

Source: TRAINTRACK/NECTRACK (extract)

Overall, 12.63 percent of ASVAB qualified students were academically disenrolled from A-School. The overall academic disenrollment rate of waived students was 21.22 percent, while 21.49 percent of all JOBS participants were academically disenrolled. These results indicate that for the sample

population, the JOBS students academic attrition closely resembles the non-JOBS waived academic attrition. Therefore, for the population analyzed, ASVAB waived and JOBS students do academically disenroll at a higher rate than those who are ASVAB qualified.

It is important to remember that there are two ways to display academic attrition rates. Instead of showing the percentages of persons who failed, the inverse and positive side of allowing ASVAB waived students to attend A-School, is to present the number of students who passed. An evaluation of this type serves to accentuate the positive aspects of allowing ASVAB waived individuals to attend A-School -- that is, that many of the waived students do pass and succeed in the opportunity that has been presented to them. The tables in use display the attrition rates, or how many students are lost. This analysis was not undertaken to dwell on the negative aspect or to limit the opportunities of potential students, it was pursued to find efficiencies in the assignment system and possibly target specific ratings where waived persons experienced high attrition rates.

An important observation that must be considered is that 84 percent (1,259) of all persons (1,500) who were disenrolled for academic reasons came from the ASVAB qualified category. This emphasizes the fact that the overwhelming majority of academic disenrollees have met the prerequisite ASVAB requirements. Nevertheless, if efficiencies can be realized in the assignment of waived or JOBS persons in high attrition ratings, small

improvements in these selection decisions may lead to substantial savings to the Navy through reduced A-School attrition.

Some ratings were identified as having higher academic attrition rates than others. The A-School pipelines in the sample population with the top five academic attrition rates are depicted in Table 6. This table reinforces the point that an academic attrition problem does not solely exist with persons who required ASVAB waivers. The ASVAB qualified group also experienced a high rate of academic attrition in these top five ratings. Four of the top five schools had high academic attrition for both ASVAB qualified and ASVAB waived groups.

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TABLE 6

**TOP FIVE ACADEMIC ATTRITION A-SCHOOL PIPELINES IN FISCAL 1988 FOR ASVAB QUALIFIED, ASVAB WAIVERED, AND JOBS STUDENTS**

<u>ASVAB QUALIFIED</u>		<u>ASVAB WAIVED</u>		<u>JOBS</u>	
<u>Rating</u>	<u>Academic Attrition rate (percent)</u>	<u>Rating</u>	<u>Academic Attrition rate (percent)</u>	<u>Rating</u>	<u>Academic Attrition rate (percent)</u>
CTM	29.27	AE	51.72	GM	52.94
GM	24.59	GM	41.46	ET-AEF	44.44
ET-AEF	24.29	ET-AEF	34.78	FC	30.00
AC	20.07	AC	36.36	BT4	22.39
FC	16.10	CTM	30.77	GSM	21.74

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Source: TRAINTRACK/NECTRACK (extract)

The CTM rating had the highest academic attrition rate for ASVAB qualified students at 29.27 percent. It also had the highest rate of ASVAB qualified individuals of the 15 ratings examined. In addition, five of 11 (45.45 percent) waived students were academically disenrolled from the CTM curriculum. This may

indicate the difficulty of the CTM curriculum.

Out of the ASVAB waived category, it is interesting to note that five of these ratings account for 76 percent (146 of 192 total waived academic disenrollees) of the academic attrition for waived students. Table 7 displays these 5 ratings and the corresponding number of academic disenrollments for ASVAB waived students. For students requiring ASVAB waivers, 51.72 percent of the persons in the AE rating were academically disenrolled. The GSM and OS ratings had the lowest academic attrition rates of the waived category, with a 4.76 and 6.04 percent academic attrition rate, respectively.

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**TABLE 7**

**RATINGS WHICH COMPRISE 75 PERCENT OF THE TOTAL NUMBER OF  
ACADEMIC DISENROLLMENTS OF THE TOP 15 ATTRITION A-SCHOOL PIPELINES  
FOR ASVAB WAIVERED STUDENTS IN FISCAL 1988**

<u>RATING</u>	<u>NUMBER ACADEMICALLY DISENROLLED</u>
AE	45
BT4YO	23
ET-AEF	32
GM	17
MM4YO	29
TOTAL	146

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Source: TRAINTRACK/NECTRACK (extract)

Although the above ratings account for only 57 percent (515) of the ASVAB waived total enrollment (905), they account for 75 percent of total ASVAB waived attrition. In addition, for these five ratings, with the exception of the AE rating, which had no JOB students enrolled, the JOBS academic attrition in the remaining

four of these top five schools, comprises greater than 80 percent (40) of all JOBS academic attrition (49). The JOBS student academic attrition, combined with the ASVAB waived group attrition for these five ratings represents 77 percent (186) of the attrition (241) for students who had not met the prerequisite ASVAB score. Therefore, these five ratings are identified as experiencing high academic attrition for waived students, and any further research on ASVAB waived attrition should examine the above ratings.

Six ratings of the ASVAB qualified group accounted for 80 percent of the ASVAB qualified group's academic attrition, while they represent only 60 percent of the total ASVAB qualified enrollment. These ratings accounted for 992 of 1,259 total academic disenrollees for all ASVAB qualified students in the sample population. Table 8 displays these six ratings and the corresponding number of academic disenrollments for ASVAB qualified students.

**TABLE 8**

**RATINGS WHICH COMPRISE 80 PERCENT OF THE TOTAL NUMBER OF  
ACADEMIC DISENROLLMENTS OF THE TOP 15 ATTRITION SCHOOL PIPELINES  
FOR ASVAB QUALIFIED STUDENTS IN FISCAL 1988**

<u>RATING</u>	<u>NUMBER ACADEMICALLY DISENROLLED</u>
ET-AEF	351
FC	170
GM	167
MM4YO	118
BT4YO	97
AE	89
TOTAL	992

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Source: TRAINTRACK/NECTRACK (extract)

It is noteworthy that five of these six ratings were also among the top attrition schools for the ASVAB waived category. The above six schools account for 87 percent (43 of 49) JOBS program participants academic attrition.

### C. ACADEMIC SETBACKS

Some students who attend Navy A-Schools receive "setbacks" (placement in a class with a later completion date) for reasons of academic performance. Students who are set back academically are:

given an opportunity to repeat only that portion of a course for which he or she requires refresher training, normally not exceeding 25 percent of the total course length and only when all other forms of remediation have been exhausted.  
[Ref. 17: p. 3]

Academic setbacks are a concern to the Navy because setback students take longer to get to the fleet, which results in a decreased productive output, and these individuals cost more because they stay in the training pipeline longer. The positive side of allowing individuals to be set back is that training dollars have already been invested in the individual, so why not allow him every opportunity to pass the course. It may cost more money to recruit another sailor and get him into the pipeline, than it would to setback the individual who experiences academic problems.

By setting an individual back in the training cycle, it is hoped that the individual will improve his or her academic



standing. Table 9 compares the academic setback rates of ASVAB qualified, ASVAB waived, and JOBS students.

Academic setback rates varied widely among the 15 ratings. Overall, 2,236 of the sample population (excluding those with missing test information) were academically setback, which represents 20.14 percent of all students. The ASVAB qualified individuals had a total of 1,957 individuals set back, or 19.63 percent. The non-JOBS waived group had 217 academic setbacks, or 23.98 percent, while JOBS participants experienced 62 setbacks which was 27.19 percent of all JOBS students enrolled. Those who had not met the prerequisite ASVAB score, that is ASVAB waived and JOBS students, combined for a total of 279 academic setbacks, or 24.62 percent of students who did not achieve the prerequisite ASVAB score.

TABLE 9

COMPARISON OF ACADEMIC SETBACK RATES FOR ASVAB QUALIFIED,  
WAIVERED, AND JOBS STUDENTS FOR THE TOP 15 ATTRITION SCHOOLS OF  
FISCAL 1988

RATING PIPELINE	NUMBER AND PERCENT OF PERSONS WHO WERE <u>ASVAB</u> <u>QUALIFIED</u> ACADEMICALLY SETBACK	NUMBER AND PERCENT OF PERSONS WHO WERE <u>ASVAB</u> <u>WAIVERED</u> AND ACADEMICALLY SETBACK	NUMBER AND PERCENT OF PERSONS WHO WERE <u>JOBS</u> <u>STUDENTS</u> ACADEMICALLY SETBACK	TOTAL
AC	71 (23.75)	6 (25.00)	*	77
AE	200 (23.84)	26 (29.89)	*	226
AW	52 (5.93)	3 (10.34)	*	55
BT4YO	273 (33.83)	47 (42.73)	18 (26.87)	338
BT6YO	46 (15.13)	9 (21.43)	*	55
CTM	99 (60.37)	6 (54.55)	*	105
ET-AEF	150 (10.38)	4 (4.35)	2 (22.22)	156
FC	272 (25.76)	5 (9.26)	1 (10.00)	278
GM	14 (2.06)	1 (2.44)	2 (11.76)	17
GSE6YO	14 (4.39)	2 (15.38)	*	16
GSM	50 (18.94)	4 (19.05)	4 (17.39)	58
MM4YO	372 (29.29)	54 (29.19)	29 (38.67)	455
MM6YO	30 (9.87)	4 (9.30)	*	34
OM	18 (69.23)	4 (100)	*	22
OS	296 (18.90)	42 (28.19)	6 (22.22)	344
TOTAL	1,957 (19.63)	217 (23.98)	62 (27.19)	2,236

\* No JOBS students enrolled.

Source: TRAINTRACK/NECTRACK (extract)

A comparison of the academic setback rates by rating for each of the three categories reveals that non-JOB ASVAB waived students were setback at a higher rate in 10 of 15 ratings, but overall, the setback rate of waived students was not appreciably

different from ASVAB qualified students. A notable exception was the FC rating, where the qualified persons were set back at 25.76 percent, compared to the waived students at 9.26 percent. The BT four-year obligor rating had relatively high setback rates for each category, with the ASVAB waived setback rate at 42.73 percent versus the ASVAB qualified setback rate of 33.83 percent.

For the ASVAB qualified individuals, the CTM rating had the highest setback rate at 60.37 percent, while the GM and GSE ratings had the lowest setback rates with 2.06 and 4.39 percent, respectively.

For the ASVAB waived group, the OM rating had four of four ASVAB waived students setback. The BT four-year obligor and the CTM ratings had the highest percentage of qualified students setback, with 42.73 and 54.55 percent, respectively. The lowest setback rates for ASVAB waived students were the GM and ET-AEF ratings, with 1.27 and 4.44 percent setback rates, respectively. These numbers were interesting because the GM and ET-AEF ratings had 17 and 32 waived persons academically disenroll from their ratings. The number of individuals that they setback were one for the GM rating, and 4 for the ET-AEF rating. It appears that, in these ratings, there was a policy that allowed few persons to be academically setback, and that these schools academically disenrolled individuals without setting them back.

#### **D. ATTRITION RESULTING FROM ACADEMIC SETBACKS**

Upon completion of determining the numbers and percentages of

persons who were academically setback in each of the three categories, the persons who were academically setback were examined further to evaluate the success or failure rate of those A-School students who were set back in the training cycle. Table 10 illustrates the frequency and percentage of attrition by rating, resulting from being academically set back.

**TABLE 10: COMPARISON OF ATTRITION RATES RESULTING FROM ACADEMIC SETBACKS FOR ASVAB QUALIFIED, WAIVERED AND JOBS STUDENTS FOR THE TOP 15 ATTRITION A-SCHOOLS OF FISCAL 1988**

<b>RATING</b>	<b>NUMBER AND PERCENT OF ASVAB QUALIFIED PERSONS WHO WERE SETBACK &amp; DISENROLLED</b>	<b>NUMBER AND PERCENT OF ASVAB WAIVED PERSONS WHO WERE SETBACK &amp; DISENROLLED</b>	<b>NUMBER AND PERCENT OF JOBS PERSONS WHO WERE SETBACK &amp; DISENROLLED</b>	<b>TOTAL</b>
AC	41 (41.25)	5 (83.33)	*	46
AE	73 (36.50)	23 (88.46)	*	96
AW	17 (32.69)	2 (66.67)	*	19
BT4	101 (37.00)	21 (44.68)	7 (38.89)	129
BT6	19 (41.30)	2 (22.22)	*	21
CTM	48 (48.48)	4 (66.67)	*	52
ET-AEF	94 (62.67)	4 (100)	2 (100)	100
FC	104 (38.24)	3 (60.00)	1 (10.00)	108
GM	5 (35.71)	1 (100)	2 (100)	8
GSE	7 (50.00)	1 (100)	*	8
GSM	24 (48.00)	2 (50.00)	3 (75.00)	29
MM4	141 (37.90)	26 (48.15)	13 (44.83)	180
MM6	9 (30.00)	1 (25.00)	*	10
OM	8 (44.44)	3 (75.00)	*	11
OS	73 (24.66)	15 (35.71)	1 (16.67)	89
<b>TOTAL</b>	<b>764 (39.04)</b>	<b>113 (52.07)</b>	<b>29 (46.77)</b>	<b>906</b>

\* No JOBS students enrolled.

Source: TRAINTRACK/NECTrack (extract)

Perhaps the most costly consequence of setting an individual back in the training cycle is if that individual eventually becomes disenrolled from the school for academic or other reasons. This analysis of the attrition resulting from academic setbacks considers that, if an individual was an academic setback and eventually becomes disenrolled for any reason then he or she is a "disenrolled setback". The rationale for this approach is that, once an individual is setback, he or she may become disheartened with this training failure, develop motivational problems which in turn may lead to non-academic attrition. Additionally, persons initially setback for academic reasons, and eventually disenrolled for any reason, cost the Navy the same amount of training dollars for whatever the reason of disenrollment.

The overall results indicate that of 1,957 ASVAB qualified persons academically setback, 764 (or 39 percent) were eventually disenrolled. ASVAB waived individuals were disenrolled at 52 percent, while JOB students experienced a disenrollment rate of 47 percent. The ASVAB waived and JOBS students disenrollment rates after being setback were relatively similar, while their disenrollment rates were relatively higher than ASVAB qualified students. Therefore, persons who required an ASVAB waiver, which includes JOBS students, do disenroll at a higher rate after being academically setback in training.

For ASVAB qualified individuals, four ratings had a higher

relative disenrollment rate compared to the overall average of 39 percent. These ratings were the CTM (48.48), ET-AEF (62.67), GSE (50.00), and GSM (48.00). The MM six-year obligor and OS ratings had lower than average disenrollment rates, with 30.00 and 24.66 percent, respectively. This may indicate that for these ratings, academically setting a person back was more successful because they achieved a relatively lower disenrollment rate in these ratings.

ASVAB waived students had higher disenrollment rates after being set back in 13 of 15 ratings examined. However, the disenrollment rates varied greatly by rating. JOBS students in the BT rating had a comparable disenrollment rate after being set back with the ASVAB qualified persons. In the MM rating, JOBS persons were disenrolled at a seven-percent higher rate.

#### **E. NON-ACADEMIC ATTRITION**

Students can be disenrolled at A-School for reasons that are non-academic. Examples of non-academic attrition are lack of motivation, student ineligibility through not meeting physical requirements, disciplinary offenses, administrative causes, medical action, or death. Table 11 illustrates the non-academic attrition rates for the ASVAB qualified, waived and JOBS categories.

Overall, ASVAB qualified individuals in the sample population were non-academically disenrolled at 10.71 percent, and again, the percentages varied widely among the ratings. The ASVAB waived individuals had an overall non-academic disenrollment rate of 10.83 percent, while the JOBS program participants had a non-academic disenrollment rate of 15.79 percent.

**TABLE 11**

**COMPARISON OF NON-ACADEMIC ATTRITION RATES FOR ASVAB QUALIFIED,  
WAIVERED, AND JOBS STUDENTS FOR THE TOP 15 ATTRITION A-SCHOOLS OF  
FISCAL 1989**

<b>RATING</b>	<b>NUMBER AND PERCENT OF PERSONS ASVAB QUALIFIED WHO WERE NON- ACADEMIC ATTRITES</b>	<b>NUMBER AND PERCENT OF PERSONS ASVAB WAIVERED WHO WERE NON- ACADEMIC ATTRITES</b>	<b>NUMBER AND PERCENT OF JOBS STUDENTS WHO WERE NON- ACADEMIC ATTRITES</b>	<b>TOTAL</b>
AC	21 (7.02)	4 (16.67)	*	25
AE	56 (6.67)	6 (6.90)	*	62
AW	83 (13.28)	2 (6.90)	*	85
BT4YO	89 (11.03)	9 (8.18)	7 (10.45)	106
BT6YO	43 (14.14)	5 (11.90)	10 (14.93)	58
CTM	4 (2.44)	0 (0.0)	*	4
ET-AEF	174 (12.04)	16 (17.39)	*	190
FC	158 (14.96)	11 (20.37)	2 (20.00)	171
GM	100 (14.73)	6 (14.63)	2 (11.76)	108
GSE6YO	17 (5.33)	3 (23.08)	*	20
GSM	33 (12.50)	1 (4.76)	3 (13.04)	37
MM4YO	144 (11.34)	17 (9.19)	9 (12.00)	170
MM6YO	26 (8.55)	4 (9.30)	*	30
OM	9 (34.62)	0 (0.0)	*	9
OS	110 (7.02)	14 (9.40)	3 (11.11)	127
<b>TOTAL</b>	<b>1067 (10.71)</b>	<b>98 (10.83)</b>	<b>36 (15.79)</b>	<b>1201</b>

\* No JOBS program persons enrolled.

Source: TRAINTRACK/NECTRACK (extract)

Therefore, there is no relative difference between the non-academic attrition rates of ASVAB qualified and waived individuals. JOBS students experience slightly higher non-academic attrition rates, but due to the small numbers involved, these

percentages can vary greatly by small changes in the frequency of disenrollments.

#### **F. OVERALL ATTRITION**

Table 12 is a combination of academic and non-academic attrition data that has already been presented. These data, used with the data in Table 11, suggest that, since the overall non-academic attrition rates are similar for ASVAB qualified, ASVAB waived, and JOBS program students, then the difference in the overall attrition rates can be attributed to academic attrition. The non-academic attrition rates were not analyzed in detail. They were only evaluated to reveal if there were any underlying reasons that ASVAB waived persons would have a higher or lower non-academic attrition.



**TABLE 12**

**COMPARISON OF A-SCHOOL OVERALL ATTRITION FOR ASVAB QUALIFIED,  
ASVAB WAIVERED, AND JOBS PARTICIPANTS FOR THE TOP 15 ATTRITION  
A-SCHOOLS OF FISCAL 1988**

<b>RATING</b>	<b>ASVAB QUALIFIED</b>	<b>ASVAB WAIVED</b>	<b>JOBS PROGRAM</b>	<b>TOTAL</b>
AC	81 (27.09)	11 (45.83)	*	92 (28.48)
AE	145 (17.28)	51 (58.62)	*	196 (21.17)
AW	109 (17.44)	6 (20.69)	*	115 (17.58)
BT4	186 (23.05)	32 (29.09)	22 (32.84)	240 (24.39)
BT6	62 (20.39)	10 (23.81)	*	72 (20.81)
CTM	52 (31.71)	5 (45.45)	*	57 (32.57)
ET-AEF	525 (36.33)	48 (52.17)	4 (44.44)	577 (37.32)
FC	328 (31.06)	19 (35.19)	5 (50.00)	352 (31.43)
GM	267 (39.32)	23 (56.10)	11 (64.71)	301 (40.84)
GSE	21 (6.58)	4 (30.77)	*	25 (7.53)
GSM	54 (20.45)	2 (9.52)	8 (34.78)	64 (19.63)
MM4	262 (20.63)	46 (24.86)	21 (28.00)	329 (21.50)
MM6	44 (14.47)	7 (16.28)	*	51 (14.70)
OM	15 (57.69)	3 (75.00)	*	18 (52.94)
OS	175 (11.17)	23 (15.44)	4 (14.81)	202 (11.60)
<b>TOTAL</b>	<b>2,326 (23.34)</b>	<b>290 (32.04)</b>	<b>71 (31.14)</b>	<b>2,691 (24.24)</b>

\* No JOBS program students.

Source: TRAINTRACK/NECTRACK (extract)

With no striking differences noted in non-academic attrition among the different categories, Table 12 is presented to denote the overall attrition numbers from the A-School sample population.

## V. CONCLUSIONS AND RECOMMENDATIONS

The purpose of this thesis was to analyze the effect of ASVAB waivers on A-School academic attrition. This was accomplished by developing a computerized data base, utilizing an extract of the Enlisted Training Tracking File (TRAINTRACK), and the Navy Enlisted Classification Tracking File (NECTRACK). In addition, a review of literature was undertaken to provide a summary of available information on factors that influence attrition, the validity of the ASVAB, and criteria for the selection of waived students to attend Navy A School. Finally, the data base was explored by conducting an analysis of those individuals who had not met the prerequisite ASVAB score, and then comparing their A-School performance with those who had attained the minimum score.

### A. CONCLUSIONS

The following specific conclusions are drawn from the results of the study:

1. In the aggregate, persons who required an ASVAB waiver and JOBS Program students academically disenroll at a higher rate than individuals who had met the prerequisite ASVAB score.
2. The AE, BT four-year obligor, ET-AEF, GM and MM four-year obligor rating pipelines experience relatively high academic attrition for waived students.
3. Academic setback rates varied widely among the 15 ratings in the sample population; but overall, the ASVAB waived setback rate was not appreciably different than that of the qualified students, with a few exceptions. Except for the MM four-year obligor rating, the JOBS students' setback rates were also not appreciably different from that of the qualified students overall.

4. The overall attrition rate of individuals who were academically set back was relatively similar for ASVAB waived and JOBS students. The attrition rate of ASVAB qualified students, after being setback, was lower than the ASVAB waived and JOBS students. Although the disenrollment rate for ASVAB qualified students was lower, the overall percentage of students disenrolled after being academically setback is considered high for all three categories.
5. The non-academic attrition rates of ASVAB qualified, waived and JOBS students did not differ dramatically. Therefore, the differences in the overall attrition can be attributed mainly to the differences in academic attrition.

## B. RECOMMENDATIONS

The following recommendations are based upon the results of this thesis:

1. Evaluate the methods and procedures that are used to place ASVAB test data into the TRAINTRACK/NECTRAK data base, since over 16 percent of the sample population's test scores were missing.
2. Evaluate the academic performance of waived students in the following ratings: AE, BT and MM-four year obligors, ET-AEF, and GM. These ratings were identified in this analysis as experiencing a high rate of attrition for ASVAB waived students. The policy of assigning persons who require ASVAB waivers to high attrition schools should be reviewed.
3. Conduct a cost benefit analysis of the attrition, retention, advancement and reenlistment characteristics of ASVAB waived individuals. An important benefit of higher retention is a corresponding reduction in training costs of fleet replacements. During the first enlistment, training costs are high; and in the current budgetary environment, it is essential that the Navy initiate policies that encourage sailors to stay in the Navy.
4. Evaluate additional basic skill training for Navy A-Schools that were found to have especially high academic attrition rates. This analysis revealed that even for ASVAB qualified individuals, academic attrition was high at some Navy A-Schools.

5. Utilize the SAS program developed for this thesis research (as updates to the TRAINTRACK/NECTRACK become available), to analyze the academic performance and attrition of ASVAB qualified, waived and JOBS students.
6. Evaluate the academic performance of individuals who initially disenrolled from an A-School, are reclassified, and then given an opportunity to attend a less difficult A-School. This evaluation will aid in determining of the effectiveness of reclassification decisions.
7. Analyze the academic attrition and setback performance variables of ASVAB waived individuals, based on the number of points that are waived.
8. Extend this analysis to encompass all Navy enlisted rating pipelines, to determine the success rate of academic setback decisions across all Navy A-Schools, to identify areas where efficiencies in academic setback decisions can be realized.
9. Further research of the academic performance of persons with ASVAB waivers at Navy A-Schools should review the various demographic characteristics of A-School students, since ASVAB test scores are highly correlated with these characteristics (especially racial/ethnic group and gender).

## APPENDIX A

### TEST SCORE WAIVERS

1. Waivers. Test score criteria established in enclosure (1) are the minimum required. However, in the event the number of qualified new accessions and recruits fall below the number necessary to meet authorized school quotas, waivers may be considered during SPIRIT selection. Test score waivers are not authorized incident to reclassification. In recommending recruit personnel for ratings, Enlisted Classifiers at recruit training commands are authorized to recommend personnel for ratings within the following limits:

a. Six points on two test combinations.

b. Nine points on three test combinations (including those where one test is doubled (i.e. AR + 2MK + GS)).

c. Ten points on a four-test combination of which there are two:

(1) AR + MK + GS + EI

(2) WK + AR + NO + AD/VE + AR + NO + CS

d. No waiver of a test score is authorized if a minimum is indicated for a single test, as with the WK/VE for submarine training.

e. No waiver of a test score is authorized for the following special tests:

(1) Nuclear Field Qualification Test (NFQT)

(2) Defense Language Aptitude Battery (DLAB)

2. Waiver Utilization. Enlisted Classifiers shall utilize extreme caution in recommendations for waivers. Maximum waiver limits should be utilized only in those cases where the individual indicates a high degree of motivation or has evidence of prior training and/or experience and has requested assignment. Consideration should be given to recommending class "A" school assignment via Job Oriented Basic Skills (JOBS) Program.

3. Record Documentation. Service record entries for recommended test score waivers are not required. Personnel enlisted on the basis of one test who are later retested are occasionally unqualified on the latter test, at times below the normal waiverable limits set forth above. When a retest results in test scores which are below waiverable limits, and the individual is retained in the original program, a brief explanation of the reason

is to be entered in the "Remarks" section of the Enlisted Classification Record (e.g., QUALIFIED FOR SCHOOL/PROGRAM/OCCUPATIONAL SPECIALTY ON BASIS OF PREVIOUS TEST RESULTS (NAME AND FORM)).

Source: NAVMILPERSCOMINST 1236.1D dated 17 September 1985

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